In the Claims:

Amend claims 31, 34 and 44 as follows:

Add new claims 45-54 as below.

31. (currently amended) A reconfigurable optical routing device comprising an integrated multiphase spatial light modulator for spatial phase modulation of unpolarized light of a predetermined wavelength, the integrated spatial light modulator having a substantially planar liquid crystal layer, a single two dimensionally continuous layer reflective of said light of said wavelength and a wave-plate layer, the wave-plate layer providing an optical retardance of $(2n+1)\lambda/4$, said liquid crystal layer having two opposed faces and being disposed and configured to provide an out of plane tilt in response to a voltage applied between said faces, and said liquid crystal layer being spaced from the reflective layer by the said wave-plate layer, wherein the integrated spatial light modulator comprises an integrated array of phase modulating elements and voltage application circuitry, the voltage application circuitry for applying desired voltages across the liquid crystal layer whereby the liquid crystal layer has desired values of out of plane tilt; wherein the integrated multiphase spatial light modulator comprises an array of electrodes, each of the electrodes being associated with a respective portion of the liquid crystal layer to define a said phase modulating element, the electrodes being such that application of voltage to each electrode causes the portion of the liquid crystal layer associated with the said electrode to have a specific value of said out-of-plane tilt; and:
wherein the voltage application circuitry is adapted to apply voltages to said array of electrodes for varying a deflection angle of light incident upon said array of phase modulating elements.

32. (original) The reconfigurable optical routing device of Claim 31, wherein said liquid crystal layer is a nematic liquid crystal layer.

33. (original) The reconfigurable optical routing device of Claim 31, wherein said liquid crystal layer is a pi-cell.

34. (currently amended) A reconfigurable optical routing device comprising a first and a second integrated multiphase spatial light modulator for spatial phase modulation of unpolarized light of a predetermined wavelength, the integrated

spatial light modulators having a substantially planar liquid crystal layer, a single two dimensionally continuous layer reflective of said light of said wavelength and a wave-plate layer, the wave-plate layer providing an optical retardance of $(2n+1)\lambda/4$, said liquid crystal layer having two opposed faces and being disposed and configured to provide an out of plane tilt in response to a voltage applied between said faces, and said liquid crystal layer being spaced from the reflective layer by the said wave-plate layer, wherein the integrated spatial light modulators comprise an integrated array of phase modulating elements and voltage application circuitry, the voltage application circuitry for applying desired voltages across the liquid crystal layer whereby the liquid crystal layer has desired values of out of plane tilt; wherein the integrated multiphase spatial light modulators comprise an array of electrodes, each of the electrodes being associated with a respective portion of the liquid crystal layer to define a said phase modulating element, the electrodes being such that application of voltage to each electrode causes the portion of the liquid crystal layer associated with the said electrode to have a specific value of said out-of-plane tilt; and:
wherein the voltage application circuitry is adapted to apply voltages to said array of electrodes for varying a deflection angle of light and the second integrated spatial light modulator is disposed with respect to the first integrated spatial light modulator for receiving light from said first integrated spatial light modulator thereby to route said light.

35. (original) The reconfigurable optical routing device of Claim 34, having a first array of optical fibers forming light sources directed to be off-normally incident on the first integrated spatial light modulator and a second array of optical fibers forming light receivers directed to be off-normally incident on the second integrated spatial light modulator for receiving light from the second integrated spatial light modulator.

36. (original) The reconfigurable optical routing device of Claim 34, wherein said liquid crystal layer is a nematic liquid crystal layer.

37. (original) The reconfigurable optical routing device of Claim 34, wherein said liquid crystal layer is a pi-cell.

38. (original) The reconfigurable optical routing device of Claim 34, in

which a half wave plate is disposed between said first and second spatial light modulators.

39. (original) A routing switch comprising a first and a second integrated multiphase spatial light modulator for spatial phase modulation of unpolarized light of a predetermined wavelength, the integrated spatial light modulators having a substantially planar liquid crystal layer, a layer reflective of said light of said wavelength and a wave-plate layer, the wave-plate layer providing an optical retardance of $(2n+1)\lambda/4$, said liquid crystal layer having two opposed faces and being disposed and configured to provide an out of plane tilt in response to a voltage applied between said faces, and said liquid crystal layer being spaced from the reflective layer by the said wave-plate layer, wherein the integrated spatial light modulators comprise an integrated array of phase modulating elements and voltage application circuitry, the voltage application circuitry for applying desired voltages across the liquid crystal layer whereby the liquid crystal layer has desired values of out of plane tilt; wherein the integrated multiphase spatial light modulators comprise an array of electrodes, each of the electrodes being associated with a respective portion of the liquid crystal layer to define a said phase modulating element, the electrodes being such that application of voltage to each electrode causes the portion of the liquid crystal layer associated with the said electrode to have a specific value of said out-of-plane tilt; and: wherein the voltage application circuitry is adapted to apply voltages to said array of electrodes for varying a deflection angle of light and the second integrated spatial light modulator is disposed with respect to the first integrated spatial light modulator for receiving light from said first integrated spatial light modulator thereby to route said light,
the device further comprising:
a first array of optical fibers forming light sources directed to be off-normally incident on the first integrated spatial light modulator and a second array of optical fibers forming light receivers directed to be off-normally incident on the second integrated spatial light modulator for receiving light from the second integrated spatial light modulator; and
drive circuitry for forming a respective plurality of switching holograms on each integrated spatial light modulator, each said switching hologram on said first integrated spatial light modulator in use being operative to deflect light incident on said first integrated spatial light modulator to said switching holograms on said second integrated spatial light modulator, and each said switching hologram on said second integrated

spatial light modulator in use being operative to deflect said light beams to a respective optical receiver.

40. (original) The routing switch of Claim 39, wherein the switching holograms are spaced apart on said first and second integrated spatial light modulators and the first and second integrated spatial light modulators are disposed such that a respective zero-order beam reflected from each switching hologram on said first integrated spatial light modulator is incident on a spacing between two adjacent switching holograms on said second integrated spatial light modulator.

41. (original) The routing switch of Claim 39, wherein a half wave plate is disposed between said first and second integrated spatial light modulators.

42. (original) The routing switch of Claim 39, wherein the first and second spatial light modulators are mutually offset so no zero-order beams from the first spatial light modulator are incident on the second spatial light modulator.

43. (original) The routing switch of Claim 39, wherein the switching holograms are spaced apart on said first and second spatial light modulators, and the first and second spatial light modulators are disposed such that a respective second-order beam from each switching hologram on said first spatial light modulator is incident on a space between two adjacent switching holograms on said second spatial light modulator.

44. (currently amended) A method of routing a light beam incident on an array of phase modulating elements, the light beam having a first component polarized in a first direction and a second component polarized in a second direction orthogonal to the first, the method comprising:
providing an integrated spatial light modulator comprising a liquid crystal layer, a wave plate layer having an optical retardance of $(2n+1)\lambda/4$ and a single two dimensionally continuous reflector layer, the liquid crystal being responsive to a variation in a drive voltage to provide a variation in out-of-plane director angle tilt, the spatial light modulator having an array of electrodes wherein each electrode is associated with a respective portion of the liquid crystal layer to define a said phase modulating element whereby the spatial light modulator comprises a said array of phase modulating

elements;
applying respective drive voltages to each said electrode whereby the portion of liquid crystal associated with the electrode has a respective specific value of director angle tilt;
applying said beam to the integrated spatial light modulator whereby the first and second components each pass through the liquid crystal layer and the wave plate layer, and are reflected at the reflector layer to again pass through the wave plate layer and liquid crystal layer to emerge with both components phase modulated by the same amount; and
controlling the drive voltages to vary a deflection direction of said light beam due to said array of phase modulating elements.

New claims 45-54

45. (new) A reflective liquid crystal spatial light modulator comprising a two dimensional array of phase modulating elements each having a respective single reflective electrode, a quarter wave plate disposed on the reflective electrode, a liquid crystal layer disposed over the quarter wave-plate and a transparent conductive layer over the liquid crystal layer, wherein the transparent conductive layer forms a common electrode to said array.

46. (new) The reflective liquid crystal spatial light modulator of Claim 45, wherein said liquid crystal layer is a nematic liquid crystal layer.

47. (new) The reflective liquid crystal spatial light modulator of Claim 45, wherein said liquid crystal layer is a pi-cell.

48. (new) A beam steering device for steering light of a predetermined wavelength, the beam steering device having a reflective liquid crystal spatial light modulator comprising a substrate, a first electrode layer extending over the substrate and forming a two-dimensional array of first electrodes, wherein the first electrodes are reflective of light of said wavelength, a quarter wave plate and a liquid crystal layer disposed over the first electrode layer, and a transparent conductive layer forming a common electrode plane, the material of the liquid crystal layer providing out of plane tilt in response to voltage applied between first electrodes and the transparent conductive layer.

49. (new) The beam steering device of Claim 48, wherein said liquid crystal layer is a nematic liquid crystal layer.

50. (new) The beam steering device of Claim 48, wherein said liquid crystal layer is a pi-cell.

51. (new) A reflective beam steering device having plural output ports and capable of steering an off-normal incident beam of light to any of said output ports, the beam steering device having a reflective liquid crystal spatial light modulator comprising two electrode layers and a liquid crystal layer, wherein the liquid crystal layer is disposed between said two electrode layers, wherein liquid crystal layer is arranged to provide out of plane lilt in response to voltage applied between said two electrode layers, and wherein the electrodes of at least one of said electrode layers define a regular two dimensional array of pixels of said modulator, each pixel forming a respective phase modulating element for an incident beam of light, the said phase modulating elements being controllable by said voltage, the spatial light modulator further comprising pixel driving circuitry for causing appropriate two dimensional hologram patterns to be provided by said two dimensional array of pixels for deflecting a said off-normal incident beam of light with an angle of reflection differing from an angle of incidence, wherein the spatial light modulator includes an integral quarter wave plate whereby the beam steering device is polarization-independent.

52. (new) The beam steering device of Claim 51, wherein said liquid crystal layer is a nematic liquid crystal layer.

53. (new) The beam steering device of Claim 51, wherein said liquid crystal layer is a pi-cell.

54. (new) A method of steering a beam of light of a predetermined wavelength, the method comprising:

providing a reflective liquid crystal spatial light modulator comprising a substrate, a first electrode layer extending over the substrate and forming a two-dimensional array of first electrodes, wherein the first electrodes are reflective of light of said wavelength, a quarter wave plate and a liquid crystal layer disposed over the first electrode layer, and a second electrode extending over said two dimensional array, said second electrode being transparent to light of said wavelength, the material of the liquid crystal layer providing out of plane tilt in response to voltage applied between each first electrode and the second electrode,

wherein each first electrode forms, together with the second electrode and a portion of liquid crystal material therebetween, a respective phase modulating element;

causing a said beam of light to be incident upon said reflective liquid crystal spatial light modulator at a non-normal angle of incidence,

applying voltages between first electrodes and said second electrode for causing corresponding phase modulating elements to display appropriate two dimensional hologram patterns

whereby said beam of light emerges from said modulator at an angle of reflection differing from said non-normal angle of incidence.